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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,355	07/11/2003	Uzi Lev-Ami	MKSI 1003-1 / MKS-133	1528
22470	7590	10/18/2004	EXAMINER	
HAYNES BEFFEL & WOLFELD LLP P O BOX 366 HALF MOON BAY, CA 94019			FRANK, ELLIOT L	
			ART UNIT	PAPER NUMBER
			2125	

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/617,355

Applicant(s)

LEV-AMI ET AL.



Examiner

Elliot L Frank

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10, 14-18, 23, 26 and 27 is/are rejected.
- 7) ☒ Claim(s) 5-9, 11-13, 19-22, 24 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The specification and drawings have been reviewed without the discovery of any significant errors. The applicant is nevertheless encouraged to review the specification and drawings to correct any informality encountered.

Claim Objections

2. Claims 1 and 22 are objected to because of the following informalities:
 - a. Claim 1 is objected to for containing minor punctuation problems. It is suggested that there should be a colon (:) after the word "comprising" in line 3 of the claim.
 - b. Dependent claim 22 requires that that the wafer be a semiconductor wafer. Claim 15, from which 22 depends, claims a semiconductor process in which the workpiece is a wafer. Claim 22 is deemed to contain a redundant limitation to what is already required in claim 15.
 - c. Appropriate correction is required.

Claim Rejections - 35 USC § 112

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3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject

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matter which applicant regards as the invention. Claim 3 is a dependant claim that currently depends from itself. The examiner believes that claim 3 should actually depend from claim 2, and has interpreted it in this manner for the sake of examination.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1,14 and 15 rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al. (USPN 6,097,204 A).

Claim 1 has the following requirements:

1. A computing apparatus configured for operating a graphical user interface (GUI) for enabling a user to graphically observe a measure of process quality of a manufacturing process, comprising a displaying mechanism configured to display an icon representing a workpiece, at least one of the location and color of the icon on the displaying mechanism indicating the process quality of the manufacturing process for the represented workpiece.

In interpreting the claim, the examiner has used the explanation of sensor input described in the specification at pages 4-5, paragraph 19, to determine

that metrology tools that read wafer characteristics (such as film thickness) are included in the determination of a "a measure of process quality".

Tanaka et al. anticipates claim 1. Tanaka is an inspection device for inspecting the quality of a wafer outputted from a semiconductor manufacturing process (column 1, lines 5-19). The status of the wafers being inspected is displayed to the operators in real time (column 2, lines 6-10). The wafers are depicted graphically. The position of the wafer indicates the stage of the testing process, and the color of the wafer indicates a quality condition of the device (column 5, line 63-column 6, line 55). Therefore, the limitations of claim 1 are anticipated in entirety in Tanaka et al.

14. The apparatus of claim 1, wherein the workpiece is a semiconductor wafer (column 1, lines 5-8, wherein the system is used to test semiconductor wafers).

Claim 15 has the same functional requirements as claims 1 and 14 combined, and therefore it is also anticipated by the same citations in the combined references.

Claims 1,14 and 15 are read in entirety in Tanaka et al.

Claim Rejections - 35 USC § 103

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

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said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2-4, 16-18, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (USPN 6,097,204 A) in view of Laitinen-Vellonen (USPN 6,792,388 B2).

Claims 2-4 depend from claim 1. Claims 16-18 depend from claim 15.

Tanaka et al anticipates the requirements of claims 1 and 15.

While Tanaka et al. is a semiconductor wafer test system that graphically displays a wafer quality condition, it does not anticipate the additional requirements of claims 2-4 wherein the status of a workpiece is displayed in a circular target-like graphic.

Laitinen-Vellonen ("L-V"), analogous to Tanaka et al. in that both systems deal with monitoring and analyzing process quality (L-V, column 1, lines 10-21), reads on the additional requirements of claims 12-14 as follows:

2. The apparatus of claim 1, wherein the display mechanism is configured to display concentric circles, each of the circles indicating a different process quality of the manufacturing process (figure 2, specifically item 10, of L-V discloses a quality graph made up of concentric circles).

3. The apparatus of claim 3, wherein an innermost one of the concentric circles indicates a highest process quality, a next outermost one of the concentric circles indicates a lesser process quality, and a still next outermost one of the concentric circles indicates a still lesser process quality (column 4, lines 24-36, wherein L-V explains that, "In an abnormal situation, the dot will

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move away from the origin." Therefore, the quality decreases as the dot move outward from the origin.

4. The apparatus of claim 2, wherein the displaying mechanism is configured to display the icon in the concentric circle corresponding to the process quality of the manufacturing process for the represented workpiece (column 4, lines 24-36, wherein the process quality is represented by the location of a dot relative to the origin and the concentric circles which surround the origin).

Claims 16-18 have the same functional requirements as claims 2-4, and therefore would have been obvious in view of the same citations in the combined references.

Claim 26 includes the workpiece display and quality measurement aspects of claim 1, previously cited in Tanaka et al. at column 2, lines 6-10, with the requirement that the position of the displayed workpiece correspond to a quality measure, previously cited in L-V at column 4, lines 24-36 (disclosing that the dot position on the graph is indicative of process quality).

Claim 27 requires that the process quality acceptability be indicated on the terminal by a color. Tanaka et al. reads on this requirement at column 5, line 63-column 6, line 55 wherein workpiece acceptability is indicated by a color.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the elements of L-V into Tanaka et al. to have provided a method to monitor information that would have ordinarily

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been overwhelming to an operator in a clear and concentrated format (L-V, column 4, lines 24-36).

9. Claims 10 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (USPN 6,097,204 A) in view of Singhal (USPN 5,225,998 A).

Claim 10 depends from claim 1. Claim 23 depends from claim 15.

Tanaka et al. anticipates the requirements of claims 1 and 15.

While Tanaka et al. is a semiconductor wafer test system that graphically displays a wafer quality condition, it does not anticipate the additional requirements of claim 10 wherein:

10. The apparatus of claim 1, wherein the displaying mechanism is configured to display a grid with an X-axis and a Y-axis, the position of the icon in the grid in the X-direction indicating a first measure of the process quality of the manufacturing process for the represented workpiece and the position of the icon in the grid in the Y-direction indicating a second measure of the process quality of the manufacturing process for the represented workpiece.

Singhal, analogous to Tanaka et al. in that both system are used in process monitoring and quality control (Singhal, column 1, lines 10-14), reads on the additional requirements of claim 10 at column 3, line 61-column 4, line 37 which disclose the dual quality measures (CPU and CPL) plotted on the X and Y axes of the graphs shown figures 2 and 5.

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Claim 23 has the same functional requirements as claim 10, and therefore would have been obvious in view of the same citations in the combined references.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the features of Singhal into Tanaka et al. to have provided a representation which advantageously allows for the parameters of a multi-process environment to be studied over the entire process rather than individual quality processes (Singhal column 5, line 58-column 6, line 9).

Allowable Subject Matter

10. Claims 5-9, 11-13, 19-22, 24 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

a. Claim 5 requires that all of the concentric circles of claim 4 have a different color. This requirement, in combination with the limitations of claims 1-4, was neither anticipated nor obvious in view of another reference.

b. Claims 6-9 depend from claim 5, and therefore contain allowable subject matter.

c. Claim 11 requires that the icon of claim 10 vary in color depending on the worse of a quality measurement between DmodX and T2. This

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requirement, in combination with the requirements of claims 1 and 10,
was neither anticipated nor obvious in view of another reference.

- d. Claims 12 and 13 depend from claim 11, and therefore contain allowable subject matter.
- e. Claims 19-22 have the same functional requirements as claims 5-9 and 12, and therefore contain allowable subject matter.
- f. Claims 24 and 25 have the same functional requirements as claims 11 and 12, and therefore contain allowable subject matter.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 2003/0187523 A1 – Smith et al. – Graphical display method

US 2003/0222896 A1 – Hagmann et al. – Process display method

US 2003/0233387 A1 – Watanabe et al. – Process display method

USPN 5,440,478 A – Fisher et al. – Process control

USPN 5,450,326 A – Black – Process display method

USPN 5,949,678 A – Wold et al. – Process control

12. Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Elliot L Frank whose telephone number is (571) 272-3739. The examiner can normally be reached on M-F 8-5:00 (flex).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P Picard can be reached on (571) 373-3749. The

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fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ELF
15 October 2004

A handwritten signature in black ink, appearing to read 'Elliot Frank', written in a cursive style.

ELLIOT FRANK
PATENT EXAMINER